



SEQUENCE LISTING

<110> Heinrichs, Jon
Johnson, Leslie S.
Koenig, Scott
Adamou, John E.

<120> Pneumococcal Protein Homologs and Fragments for
Vaccines

<130> 469201-493

<140> U.S. 09/645,835

<141> 2000-08-25

<150> U.S. 60/150,750

<151> 1999-08-25

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<170> PatentIn Ver. 2.1

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<213> Streptococcus pyogenes

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Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
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Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
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180 185 190
Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile
195 200 205
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Arg Pro Thr Pro Ala Pro Ala Pro Gly Arg Arg Lys Ala Pro Ile Pro
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Met Pro Lys Asp Gly Lys Asp Tyr Phe Tyr Ala Arg Asp Gln Leu Asp
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 85 90 95
 His Ser His Phe Ile Phe Tyr Ala Asp Leu Lys Gly Ser Pro Phe Glu
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 Tyr Leu Ile Pro Lys Gly Ala Ser Leu Ala Lys Pro Ala Val Ala Gln
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 195 200 205
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 Val Gly Val Thr Lys Asp Ser Ile Leu Val Asp His Asp Gly His Leu
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His Gln Thr Pro Glu Leu Ser Glu Arg Glu Lys Glu Tyr Gln Glu Lys
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Ser Leu Leu Pro Asn Leu Glu Thr Leu Gly Ile Gly Phe Thr Pro Ile
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Lys Asp Ile Ser Pro Val Leu Gln Phe Lys Lys Leu Lys Gln Leu Leu
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Met Thr Lys Thr Gly Val Thr Asp Tyr Arg Phe Leu Asp Asn Met Pro
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Gln His Ile Pro Glu Ala Ile Ala Lys Asn Phe Pro Ala Val Tyr Glu
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Gly Ser Met Val Gly Asn Gly Thr Ala Glu Glu Lys Ala Ala Met Ala
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Asn His Asn His Thr Tyr Glu Asp Glu Glu Gly His Ala His Glu His
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<212> PRT

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Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu
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Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
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Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
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Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn
100 105 110

Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr
115 120 125

Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser
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Lys Arg Lys Asn Ile Arg Thr Lys Gln Gln Ile Ala Glu Gln Val Ala
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Lys Gly Thr Lys Glu Ala Lys Glu Lys Gly Leu Ala Gln Val Ala His
165 170 175

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Ala Asn Trp Val Lys Ala Lys Gly Gln Ala Asp Glu Leu Val Ala Ala
465 470 475 480

Leu Asp Gln Glu Gln Gly Lys Glu Lys Pro Leu Phe Asp Thr Lys Lys
485 490 495

Val Ser Arg Lys Val Thr Lys Asp Gly Lys Val Gly Tyr Ile Met Pro
500 505 510

Lys Asp Gly Lys Asp Tyr Phe Tyr Ala Arg Tyr Gln Leu Asp Leu Thr
515 520 525

Gln Ile Ala Phe Ala Glu Gln Glu Leu Met Leu Lys Asp Lys Lys His
530 535 540

Tyr Arg Tyr Asp Ile Val Asp Thr Gly Ile Glu Pro Arg Leu Ala Val
545 550 555 560

Asp Val Ser Ser Leu Pro Met His Ala Gly Asn Ala Thr Tyr Asp Thr
565 570 575

Gly Ser Ser Phe Val Ile Pro His Ile Asp His Ile His Val Val Pro
580 585 590

Tyr Ser Trp Leu Thr Arg Asn Gln Ile Ala Thr Ile Lys Tyr Val Met
595 600 605

Gln His Pro Glu Val Arg Pro Asp Val Trp Ser Lys Pro Gly His Glu
610 615 620

Glu Ser Gly Ser Val Ile Pro Asn Val Thr Pro Leu Asp Lys Arg Ala
625 630 635 640

Gly Met Pro Asn Trp Gln Ile Ile His Ser Ala Glu Glu Val Gln Lys
645 650 655

Ala Leu Ala Glu Gly Arg Phe Ala Ala Pro Asp Gly Tyr Ile Phe Asp
660 665 670

Pro Arg Asp Val Leu Ala Lys Glu Thr Phe Val Trp Lys Asp Gly Ser
675 680 685

Phe Ser Ile Pro Arg Ala Asp Gly Ser Ser Leu Arg Thr Ile Asn Lys
 690 695 700
 Ser Asp Leu Ser Gln Ala Glu Trp Gln Gln Ala Gln Glu Leu Leu Ala
 705 710 715 720
 Lys Lys Asn Ala Gly Asp Ala Thr Asp Thr Asp Lys Pro Glu Glu Lys
 725 730 735
 Gln Gln Ala Asp Lys Ser Asn Glu Asn Gln Gln Pro Ser Glu Ala Ser
 740 745 750
 Lys Glu Glu Lys Glu Ser Asp Asp Phe Ile Asp Ser Leu Pro Asp Tyr
 755 760 765
 Gly Leu Asp Arg Ala Thr Leu Glu Asp His Ile Asn Gln Leu Ala Gln
 770 775 780
 Lys Ala Asn Ile Asp Pro Lys Tyr Leu Ile Phe Gln Pro Glu Gly Val
 785 790 795 800
 Gln Phe Tyr Asn Lys Asn Gly Glu Leu Val Thr Tyr Asp Ile Lys Thr
 805 810 815
 Leu Gln Gln Ile Asn Pro
 820

<210> 7
 <211> 816
 <212> PRT
 <213> Streptococcus pneumoniae

<400> 7
 Met Lys Ile Asn Lys Lys Tyr Leu Val Gly Ser Ala Ala Ala Leu Ile
 1 5 10 15
 Leu Ser Val Cys Ser Tyr Glu Leu Gly Leu Tyr Gln Ala Arg Thr Val
 20 25 30
 Lys Glu Asn Asn Arg Val Ser Tyr Ile Asp Gly Lys Gln Ala Thr Gln
 35 40 45
 Lys Thr Glu Asn Leu Thr Pro Asp Glu Val Ser Lys Arg Glu Gly Ile
 50 55 60
 Asn Ala Glu Gln Ile Val Ile Lys Ile Thr Asp Gln Gly Tyr Val Thr

65	70	75	80
Ser His Gly Asp His Tyr His Tyr Tyr Asn Gly Lys Val Pro Tyr Asp			
	85	90	95
Ala Ile Ile Ser Glu Glu Leu Leu Met Lys Asp Pro Asn Tyr Lys Leu			
	100	105	110
Lys Asp Glu Asp Ile Val Asn Glu Val Lys Gly Gly Tyr Val Ile Lys			
	115	120	125
Val Asp Gly Lys Tyr Tyr Val Tyr Leu Lys Asp Ala Ala His Ala Asp			
	130	135	140
Asn Val Arg Thr Lys Glu Glu Ile Asn Arg Gln Lys Gln Glu His Ser			
	145	150	155 .
Gln His Arg Glu Gly Gly Thr Pro Arg Asn Asp Gly Ala Val Ala Leu			
	165	170	175
Ala Arg Ser Gln Gly Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Asn			
	180	185	190
Ala Ser Asp Ile Ile Glu Asp Thr Gly Asp Ala Tyr Ile Val Pro His			
	195	200	205
Gly Asp His Tyr His Tyr Ile Pro Lys Asn Glu Leu Ser Ala Ser Glu			
	210	215	220
Leu Ala Ala Ala Glu Ala Phe Leu Ser Gly Arg Gly Asn Leu Ser Asn			
	225	230	235
Ser Arg Thr Tyr Arg Arg Gln Asn Ser Asp Asn Thr Ser Arg Thr Asn			
	245	250	255
Trp Val Pro Ser Val Ser Asn Pro Gly Thr Thr Asn Thr Asn Thr Ser			
	260	265	270
Asn Asn Ser Asn Thr Asn Ser Gln Ala Ser Gln Ser Asn Asp Ile Asp			
	275	280	285
Ser Leu Leu Lys Gln Leu Tyr Lys Leu Pro Leu Ser Gln Arg His Val			
	290	295	300
Glu Ser Asp Gly Leu Val Phe Asp Pro Ala Gln Ile Thr Ser Arg Thr			
	305	310	315
Ala Arg Gly Val Ala Val Pro His Gly Asp His Tyr His Phe Ile Pro			

325	330	335	
Tyr Ser Gln Met Ser Glu Leu Glu Glu Arg Ile Ala Arg Ile Ile Pro			
340	345	350	
Leu Arg Tyr Arg Ser Asn His Trp Val Pro Asp Ser Arg Pro Glu Gln			
355	360	365	
Pro Ser Pro Gln Pro Thr Pro Glu Pro Ser Pro Gly Pro Gln Pro Ala			
370	375	380	
Pro Asn Leu Lys Ile Asp Ser Asn Ser Ser Leu Val Ser Gln Leu Val			
385	390	395	400
Arg Lys Val Gly Glu Gly Tyr Val Phe Glu Glu Lys Gly Ile Ser Arg			
405	410	415	
Tyr Val Phe Ala Lys Asp Leu Pro Ser Glu Thr Val Lys Asn Leu Glu			
420	425	430	
Ser Lys Leu Ser Lys Gln Glu Ser Val Ser His Thr Leu Thr Ala Lys			
435	440	445	
Lys Glu Asn Val Ala Pro Arg Asp Gln Glu Phe Tyr Asp Lys Ala Tyr			
450	455	460	
Asn Leu Leu Thr Glu Ala His Lys Ala Leu Phe Glu Asn Lys Gly Arg			
465	470	475	480
Asn Ser Asp Phe Gln Ala Leu Asp Lys Leu Leu Glu Arg Leu Asn Asp			
485	490	495	
Glu Ser Thr Asn Lys Glu Lys Leu Val Asp Asp Leu Leu Ala Phe Leu			
500	505	510	
Ala Pro Ile Thr His Pro Glu Arg Leu Gly Lys Pro Asn Ser Gln Ile			
515	520	525	
Glu Tyr Thr Glu Asp Glu Val Arg Ile Ala Gln Leu Ala Asp Lys Tyr			
530	535	540	
Thr Thr Ser Asp Gly Tyr Ile Phe Asp Glu His Asp Ile Ile Ser Asp			
545	550	555	560
Glu Gly Asp Ala Tyr Val Thr Pro His Met Gly His Ser His Trp Ile			
565	570	575	
Gly Lys Asp Ser Leu Ser Asp Lys Glu Lys Val Ala Ala Gln Ala Tyr			

580	585	590
Thr Lys Glu Lys Gly Ile Leu Pro Pro Ser Pro Asp Ala Asp Val Lys		
595	600	605
Ala Asn Pro Thr Gly Asp Ser Ala Ala Ala Ile Tyr Asn Arg Val Lys		
610	615	620
Gly Glu Lys Arg Ile Pro Leu Val Arg Leu Pro Tyr Met Val Glu His		
625	630	640
Thr Val Glu Val Lys Asn Gly Asn Leu Ile Ile Pro His Lys Asp His		
645	650	655
Tyr His Asn Ile Lys Phe Ala Trp Phe Asp Asp His Thr Tyr Lys Ala		
660	665	670
Pro Asn Gly Tyr Thr Leu Glu Asp Leu Phe Ala Thr Ile Lys Tyr Tyr		
675	680	685
Val Glu His Pro Asp Glu Arg Pro His Ser Asn Asp Gly Trp Gly Asn		
690	695	700
Ala Ser Glu His Val Leu Gly Lys Asp His Ser Glu Asp Pro Asn		
705	710	720
Lys Asn Phe Lys Ala Asp Glu Glu Pro Val Glu Glu Thr Pro Ala Glu		
725	730	735
Pro Glu Val Pro Gln Val Glu Thr Glu Lys Val Glu Ala Gln Leu Lys		
740	745	750
Glu Ala Glu Val Leu Leu Ala Lys Val Thr Asp Ser Ser Leu Lys Ala		
755	760	765
Asn Ala Thr Glu Thr Leu Ala Gly Leu Arg Asn Asn Leu Thr Leu Gln		
770	775	780
Ile Met Asp Asn Asn Ser Ile Met Ala Glu Ala Glu Lys Leu Leu Ala		
785	790	800
Leu Leu Lys Gly Ser Asn Pro Ser Ser Val Ser Lys Glu Lys Ile Asn		
805	810	815